

Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

Proposed
Title V, Construction/Operating
Permit: V-07-018 R1
Tennessee Valley Authority – Paradise Fossil Plant
Drakesboro, KY
October 26, 2009
Combustion Section

SOURCE ID:	21-177-00006
AGENCY INTEREST:	3239
ACTIVITY:	APE20090002

In this permitting action, the Division for Air Quality (Division) is revising the Statement of Basis (SOB) and modifying the Title V permit issued to the Tennessee Valley Authority (TVA) – Paradise Fossil Fuel Plant for two purposes. First, TVA submitted a minor revision to provide pollution controls for the reduction of sulfuric acid mist (SO₃). Second, the Division has been ordered by EPA to respond to issues related to Permit #V-07-018 that were raised by Petitioners on December 27, 2007.

On April 29, 2009, TVA submitted an application for a minor revision for its Paradise Fossil Plant in Drakesboro, Kentucky. As part of an opacity mitigation project for Units 1-3, TVA will be adding hydrated lime injection (HLI) prior to the wet flue gas desulfurization (WFGD) on each unit. Based on testing conducted at the facility an increase in emissions from units 1-3 is not expected as a result of the HLI. The project is expected to reduce emissions of SO₃ up to 1,850 tons per year (TPY).

In a letter dated July 24, 2009, and received by the Division on July 29, 2009, U.S. EPA Region 4 provided the Administrator's Order responding to the Petition (Petition No. IV-2007-3). The Petition requested U.S. EPA to object to the Title V permit issued to the TVA – Paradise Fossil Fuel Plant. In accordance with 40 CFR 70.7(g)(4), the Division shall adequately resolve any EPA objection within ninety (90) days of receiving the Administrator's objection.

The Order responded to eight (8) issues raised in the Petition, and granted the Petition on four issues. U.S. EPA granted the Petition on the following four issues:

- (1) the omission of a prevention of significant deterioration analysis for nitrogen oxides (NO_x);
- (2) the failure to require continuous opacity monitoring systems (COMS) on said boilers as well as the inadequacy of Method 9 to assure compliance;
- (3) the failure to require continuous emission monitoring systems (CEMS) for NO_x; and
- (4) the inadequacy and, thus, unenforceability of particulate matter emissions monitoring related to the coal washing and handling plant.

In response to the Order minor revisions were made to the Statement of Basis and permit. The Division will discuss and address issues raised in the Order prior to providing information relative to the minor permit revision.

Item 1 – Petitioner’s Claims Regarding PSD at Units 1-3

In the Order, EPA directed the Division to “provide a complete response to the substance of the issues raised in Petitioners’ July 31, 2007, comment letter to KDAQ.” Thus, to clarify the previous response and to provide a more complete response to the substance of the issues, the Petitioners’ comment and the Division’s original and revised responses regarding PSD at Units 1, 2, and 3 are included below:

Comment No. 1: *PSD IS AN APPLICABLE REQUIREMENT FOR THE THREE MAIN BOILERS WHICH NEEDS TO BE INCLUDED IN THE PERMIT.*

The Prevention of Significant Deterioration (PSD) provisions of the Clean Air Act’s New Source Review program, 40 CFR 52.21, is an applicable requirement with regard to nitrogen oxides (NOx) emissions from TVA Paradise Units 1, 2, and 3 because TVA modified those units after 40 CFR 52.21 became effective but before Kentucky had an approved PSD program in its SIP. Therefore, the PSD provisions must be include in TVA Paradise’s Title V permit.

Specifically, the modifications that made PSD applicable with regard to NOx are:

The work was essentially the same at all three units. It included the replacement of all cyclone burners attached to each boiler and the replacement of the lower furnace walls, floor and headers. EPA Enforcement Ex. 273; EPA Enforcement Ex. 279, at 40-42 (Hekking's pre-filed testimony); TVA Ex. 4, at 23-26 (Golden's pre-filed testimony).

Through these projects, TVA replaced all fourteen cyclone burners at each of Units 1 and 2 and replaced all twenty-three cyclone burners at Unit 3. In addition, TVA cut out and replaced the waterwall below 465 feet, including the lower headers and floor at Unit 1. TVA performed the same work at Unit 2. At Unit 3, in addition to the twenty-three cyclones, TVA replaced the waterwalls between 418 feet to 501 feet. TVA Ex. 4, at 23-25 (Golden's pre-filed testimony); EPA Enforcement Ex. 279, at 42 (Hekking's pre-filed testimony).

The magnitude of the work at each of these units was significant. Indeed, TVA had to construct monorails at the front and rear walls for lifting and positioning the cyclones at each unit. EPA Enforcement Ex. 279, at 43 (Hekking's pre-filed testimony). TVA installed a trolley system to transport the cyclones in and out of the building, and TVA constructed rigging inside the furnace to assist in attaching the wall panels and floor panels. Id.

After approval from the Board of Directors and after years of planning, the central office's Fossil and Hydro Power Division performed work on these units sequentially. [FN7] TVA implemented the work at Unit 3 first, beginning in the Fall of 1984 and requiring the unit to be shut down for six months. It then worked on Unit 1, shutting it down for approximately 6.5 months beginning in March of 1985. Finally, TVA performed the work on Unit 2 beginning in November of 1985 and lasting 4.5 months. In each case, the units were shut down for periods well beyond the four weeks typical of scheduled maintenance outages.

The work at Unit 1 and 2 required the replacement of approximately 18.5% of the total tubing in the boiler. TVA Ex. 4, at 23, 25 (Golden's pre-filed testimony). TVA replaced approximately 19.4% of the total tubing in Unit 3's boiler. Id. at 26.

In re: Tennessee Valley Authority, 9 E.A.D. 357, 2000 WL 1358649 (EPA ALJ Sept. 15, 2000) at Appendix A, p. 108-109. In support of our claim that PSD for NOx is an applicable requirement, we hereby incorporate by reference all of the evidence, including the transcripts of the live testimony, from In re: Tennessee Valley Authority, 9 E.A.D. 357, 2000 WL 1358649 (EPA ALJ Sept. 15, 2000).

The fact that the United States Court of Appeals for the Eleventh Circuit subsequently found that the Administrative Compliance Order issued to TVA was facially unconstitutional is not relevant to this comment. We are saying that if you review the information that EPA Enforcement presented to the EAB during the course of the proceeding in light of the arguments made by EPA Enforcement and even use the emission test more favorable to TVA (actual to projected actual) and use the PSD regulations that we applicable at the time of the modification, you will independently determine that there was indeed a major modification at all three units at TVA Paradise so that PSD applies to those units for NOx. [Footnote 1: We are not saying that the "actual to projected actual" test is legally mandated. We are merely saying that even using this test, which is the most favorable to TVA, you will still find a significant increase in NOx.] It is important to remember that the Eleventh Circuit's decision was based on facial analysis of Administrative Compliance Orders which does not describe any particular process for its issuance. However, in the TVA case, TVA was actually given extensive process to try to defend its case. See e.g. In re: Tennessee Valley Authority, 9 E.A.D. 357, 2000 WL 1358649 (EPA ALJ Sept. 15, 2000) at 8. Even after this trial type process, the evidence showed that TVA had indeed performed major modifications at TVA Paradise.

Therefore, the Title V Permit must include BACT limits for Units 1, 2 and 3 for NOx. We suggest that you set a temporary BACT limit of 0.085 lbs/MMBtu NOx for Unit 1, 0.1 lbs/MMBtu NOx for Unit 2 and 0.15 lbs/MMBtu based on a thirty day rolling average. The limits for Units 1 and 2 are based on TVA Paradise's actual emissions during the 2002 ozone season. See Exhibit 1. Obviously, what a particular unit achieves is achievable. Our purposed limit for Unit 3 is based on the NSPS limit. These temporary limits should go into effect immediately and should apply year round. The final BACT limits will be significantly lower but may require construction in order to comply.

The Title V permit should also include a compliance schedule which requires TVA to submit a full PSD application within 3 months of the issuance of the permit. To the extent that pre-construction monitoring is necessary, TVA should be given additional time to complete its pre-construction monitoring. While this is an aggressive schedule, the people of Kentucky should not be forced to endure TVA Paradise's illegal pollution any longer than necessary.

Division's original response:

Kentucky DAQ is aware of the current enforcement action against TVA.

EPA initially pursued TVA for alleged NSR violations through the Administrative Compliance Order (ACO) process. However, in June 2003 a three-judge panel of the 11th Circuit Court of Appeals ruled that instead of following the ACO process EPA must "prove the existence of a

CAA violation in district court, including the alleged violation that spurred EPA to issue the ACO in this case." [Tennessee Valley Authority v. Whitman, 336 F.3d 1236, 1260 (11th Cir. 2003)]. U.S. EPA sought review of that decision in the U.S. Supreme Court. In May 2004 the Supreme Court declined to grant EPA's request for review of the 11th Circuit ruling. [Leavitt v. Tennessee Valley Authority, 124 S.Ct. 2096 (2004)]. To date, there is no judicial determination of the merits of TVA's alleged NSR violations.

The U.S. EPA considers this an active enforcement case and is proceeding. Upon settlement or judicial ruling Kentucky DAQ will incorporate those terms and conditions into this permit.

Division's revised response:

As indicated in the Administrator's Order and in the August 15, 2007, Response to Comments, U.S. EPA alleged NSR violations through an Administrative Compliance Order ("ACO"). The Division's original response to the Petitioners' comment also refers to the Eleventh Circuit Court of Appeals ruling that EPA must "prove the existence of a CAA violation in district court, including the alleged violation that spurred EPA to issue the ACO in this case." *Tennessee Valley Authority v. Whitman*, 336 F.3d 1236, 1260 (11th Cir. 2003). It is important to note that the Division was not a party to the enforcement case and has not alleged that TVA committed NSR violations.

Although Petitioner referenced, relied upon and incorporated the evidence, including transcripts of the live testimony, from EPA's enforcement case against TVA (*In re Tennessee Valley Authority*, 9 E.A.D. 357 (2000)), a copy of the record was not included with the comment submitted in the August 1, 2007, letter from the Petitioners. Again, the Division was not a party to the enforcement case; therefore, the Division was not served with pleadings from the parties.

In the Order, EPA directed the Division to consider the information referenced in the factual record developed as part of the EPA proceeding against TVA in *In re Tennessee Valley Authority*, 9 E.A.D. 357 (EAB 2000) (herein after "factual record"). The Order did not address whether PSD was an applicable requirement for Paradise Units 1-3, leaving the determination to the Division.

To comply with the terms of the Order, the Division requested the factual record pertaining to TVA Paradise from EPA. On September 10, 2009, the Division began to receive portions of the factual record. On September 21, 2009, the remaining portions of the record were received. The delay in receiving the factual record created a significant obstacle for the Division to respond to the Order within the regulatory 90 days deadline. However, as directed, the Division did review all records received from EPA.

Petitioners' comment above relies solely on the factual record developed in a proceeding that was found to be unconstitutional. Specifically, the Eleventh Circuit found the following procedural defects in the proceedings relied upon in the comment: (1) the ALJ was instructed by the EAB not to make any findings of fact and conclusions of law; (2) discovery was effectively unavailable; (3) testimony was limited at the hearing at the direction of the Administrator; (4) TVA was given little time to prepare a defense; and (5) the EAB and ALJ manufactured the procedures used, ignoring the concept of the rule of law. *Tennessee Valley Authority v. Whitman*, 336 F.3d 1236, 1246 (11th Cir. 2003). Furthermore, through reviewing the factual record, the Division is aware that several issues of law and fact were disputed by TVA. The Division cannot

ignore these potential defenses and valid legal questions. Therefore, the Division disagrees with Petitioners' assertion that the Eleventh Circuit decision is not relevant.

After reviewing the factual record, the Division recognizes that there exists a question as to whether the alleged major modifications performed by TVA fell within the definition of "routine maintenance, repair or replacement". The comment above does not acknowledge or address all of the defenses raised by TVA. In reviewing the factual record, the Division determines that the type of modifications made at TVA Units 1-3 were routine maintenance, repair or replacement when industry-wide replacements are considered. Recently, a Kentucky District Court found that whether a repair is routine must be determined on an industry-wide, rather than a facility-wide basis. *U.S. v. East Kentucky Power Co-op.*, 498 F.Supp.2d 976 (E.D. Ky., 2007). According to testimony in the factual record, cyclone replacement had clearly become routine within the industry. For example, pre-filed testimony indicated that data from the Cyclone Users Association "revealed that more than 300 cyclones on more than half of the 26,152 MW of electric capacity powered by cyclone-fired boilers had been replaced...A survey of maintenance practice of other coal-burning electric utility units, representing more than 20% of the total electricity generation capability in the United States, revealed that of a population sample of 219 utility boilers, 174 waterwall replacement projects had been performed." TVA Ex. 4, at 24 (Golden's pre-filed testimony). The Division has no reason to dispute the validity of this testimony; therefore, agrees that the changes made to TVA Paradise Unit 1-3 were routine maintenance, repair or replacement.

Even if the Division did not agree that the changes to Unit 1-3 were routine, the complexity surrounding the "routine maintenance, repair or replacement" exclusion and other defenses raised by TVA supports the position that deciding whether PSD is an applicable requirement should be determined within the context of an enforcement action. Such an enforcement action would give TVA the opportunity to raise any and all possible defenses. As mentioned previously, the comment above solely relies on the factual record developed in EPA's enforcement case. Given the Eleventh Circuit decision, the Division cannot determine that there is a PSD modification solely based on the factual record. It is important to note that the Division has never issued a Notice of Violation ("NOV") regarding the changes referenced in the comment. Furthermore, the Division believes that the timing of the replacements is important. The replacements began in 1984 and concluded in 1986. *Wisconsin Elec. Power Co. v. Reilly*, 893 F.2d 901 (7th Cir. 1990) was the first case to address the scope of the exclusion in depth. Therefore, TVA was without the benefit of clear judicial interpretation. If the Division considered the changes at issue as major modifications and not routine maintenance, repair or replacement, the only appropriate course of action would be to pursue an enforcement proceeding. Given the amount of time that has passed and the fact that U.S. EPA unsuccessfully pursued an enforcement case on these exact alleged violations, the Division has not identified further PSD violations on which to base an enforcement action against TVA.

Based on the Division's independent review, the changes made to Paradise Units 1-3 were routine maintenance, repair or replacement and did not constitute a major modification.

Item 2 – Petitioner's Claims Regarding Opacity and Monitoring

The Administrator granted the Petition for the Division "to review the monitoring requirements for opacity for Units 1 and 2 and revise the permit, if necessary, to ensure that the permit requires

some monitoring for opacity during normal facility operations”, ensuring compliance with permit terms and conditions regarding opacity.

In response to this item, the Division has revised the monitoring requirements in the permit to incorporate a daily opacity monitoring requirement using Method 9 for Units 1 and 2 during normal operations.

Item 3 – NO_x CEMS

Regarding the Petitioners’ statement that NO_x CEMS are required for Units 1 and 2, the Administrator directed the Division to respond to the comment by providing an explanation that includes an evaluation of the CAA title IV requirements, Part 75 requirements, and the requirements pertaining to monitoring in Part 70.” As the Order implies, the requirement for TVA Paradise to install, calibrate, and use NO_x CEMS is located at Section G(e)2 and Section J of the V-07-018 title V permit.

The specific language requiring the use of NO_x CEMS can be found on page 43 and 44 of the permit. The language states, “Under the NO_x compliance plan, annual average NO_x emission rate for each year, determined in accordance with 40 CFR Part 75...” 40 CFR Part 75 is titled “Continuous Emission Monitoring” and requires continuous emission monitoring to demonstrate continuous compliance with the Acid Rain Program, NO_x Budget Trading Program, and the Clean Air Interstate Rule.

Under title IV of the Clean Air Act, Units 1 and 2 are subject to the Acid Rain Program pursuant to 40 CFR Part 72 and the NO_x Budget Trading Program and the Clean Air Interstate Rule pursuant to 40 CFR Part 96. Thus, Units 1 and 2 are also subject to the continuous emission monitoring requirements of 40 CFR Part 75.

For clarification of the CEM requirements, the Division has revised the permit and also included a specific reference to the NO_x CEMS requirements for each unit in Section B of the permit.

Item 4 – Petitioner’s Claims Regarding Enforceability of the PM Emission Limit for the Coal Washing and Handling Plant

The Administrator ordered the Division to identify the specific method(s) to be used by TVA in demonstrating compliance with the PM emission limits for the coal washing and handling plant, as well as to provide an adequate rationale for the chosen method(s).

In response to this item, the Division has revised the Statement of Basis (see Facility Description, Emission Units 22, 23, 25-31, 35, 39, and 40 – Coal Handling and Washing Plant) and permit to specify how TVA will demonstrate compliance with the PM and opacity limits for Emission Units 22-23, 25-31, 35, and 39-40. Please note that Emission Unit 35 was previously listed with a PM emission limit by error. This unit does not have a PM emission limit in Permit No. O-87-012. This unit is a source of fugitive emissions and was not included in the Coal Washing Plant group limits.

MINOR PERMIT REVISION – V-07-018 REVISION 1:

On April 29, 2009 Tennessee Valley Authority submitted an application for a minor revision for its Paradise Fossil Plant in Drakesboro, Kentucky. As part of an opacity mitigation project for Units 1-3, TVA will be adding hydrated lime injection (HLI) prior to the wet flue gas

desulfurization (WFGD) on each unit. Based on testing conducted at the facility, an increase in emissions from Units 1-3 is not expected as a result of the HLI. TVA anticipates that the WFGD on each unit will remove any particulate matter that may be created from the HLI. The project is expected to reduce emissions of SO₃ up to 1,850 tons per year (TPY). An increase in PM and PM₁₀ emissions is expected from the addition of storage and handling equipment for the hydrated lime and increased usage of roadways. Potential emissions of PM from the project are estimated at 20.2 TPY and 7.1 TPY for PM₁₀ emissions. This project is not a modification under Title I of the Clean Air Act as the increase in PM and PM₁₀ emissions do not exceed the significant emission increase thresholds of 25 TPY for PM and 15 TPY for PM₁₀ [401 KAR 51:001, Section 1(222)(a)]. The lime storage and handling equipment is subject to 401 KAR 59:010 and 401 KAR 63:010. The equipment is not subject to 40 CFR 60 Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants, because the affected facility does not meet the definition of a non-metallic minerals processing plant. This revision adds Emission Units 85-97 for increased travel on roads, lime handling and storage.

FACILITY DESCRIPTION

The facility consists of three cyclone-furnace coal-fired boilers, three distillate oil-fired heating boilers, eleven distillate oil-fired space heaters, three natural-draft cooling towers, and solid fuel, limestone, ash, and gypsum handling processes.

Coal is delivered by rail, truck and barge. Currently, most of the coal is cleaned in a coal wash plant prior to delivery to the coal fired boilers. TVA is currently cofiring coal fines and plans to begin cofiring wood waste. Waste products from sawmills and other wood-working facilities will be burned at a maximum of 5% of the boilers heat input (13% by weight).

All three coal-fired boilers are equipped with staged overfire air and selective catalytic reduction modules for nitrogen oxides emission control. Boiler Units 1 and 2 are equipped with venturi-type limestone slurry flue gas desulfurization scrubbers. Boiler Unit 3 is equipped with an electrostatic precipitator and a wet limestone FGD scrubber. Fly ash collected by the ESP is sluiced by the wet fly ash handling system to the fly ash pond for disposal. Bottom ash (slag) is wet sluiced to a storage pond, dewatered and then reclaimed for sale to an offsite customer. Gypsum waste slurry effluent from the limestone FGD scrubbers is wet sluiced to the onsite stacking area for disposal.

All transfers from coal conveyors are within enclosures unless otherwise noted. Foam suppression is also used as needed to provide fugitive emissions control for the conveyors feeding the old conditioners (BC-11 and BC-12), the new conditioners, and breakers 1-7 (BC-1, BC-2, BC-3, BC-50 and BC-51), compliance coal reclaim (BC-18), transfer station H (BC-32 and BC-54) and conveyor BC-55. A water spray is used as needed for fugitive emissions control on BC-49 in the barge unloader loop.

TVA has renumbered most of the emission points from its previous permits. Appendix A contains a listing comparing the new numbering system with previous permits, as well as the identification number used in the Division's emission inventory system.

Emission Units 1 and 2 Coal Fired Boilers, 6,959 MMBtu/hour

Description:	Boiler Units 1 and 2, 6959 MMBtu/hour, each, cyclone-furnace coal fired boilers
Controls:	Overfire air, Selective Catalytic Reduction (installed on Unit 1 in 2001, installed on Unit 2 on 2000), Flue Gas Desulfurization
Primary Fuel:	Coal
Alternative Fuels:	No. 2 fuel oil for startup Coal fines maximum 14% by weight. Wood Waste maximum 5% of the boilers heat input (13% by weight). Other nonhazardous waste materials such as used oil with less than 50 ppm PCB, boiler cleaning chemicals, solvents, oil-contaminated soil, rags, absorbent materials/rags and papers.
Construction Commenced:	1963

These units are subject to 401 KAR 61:015, Existing indirect heat exchangers applicable to an emissions unit with a capacity of more than 250 MMBtu/hour, which commenced construction before August 17, 1971. 40 CFR 60 Subpart D and Da are not applicable because these units were constructed prior to the effective date of those regulations.¹ However, these units are subject to the federal Acid Rain, NO_x Budget and CAIR Programs.

401 KAR 52:060, Acid rain permits, incorporates by reference 40 CFR Parts 72 to 78. These units have SO₂ allowances as listed in 40 CFR, Part 73.10 for each year from 2007 to year 2011. Emission Unit 1 has 10,818 SO₂ allowance allocations for the years 2007 to 2009, then 10,841 allowances beginning in the year 2010. Emission Unit 2 has 12,300 SO₂ allowance allocations for the years 2007 to 2009, then 12,326 allowances beginning in the year 2010. The NO_x limit and the averaging plans are established by 40 CFR 75 and 76.

401 KAR 51:160, NO_x requirements for large utility and industrial boilers, and 40 CFR 96, Subpart C, applies to these units. The NO_x Budget Permit application for these units was submitted to the Division, and received on November 11, 2004. Requirements contained in that application were incorporated into and made part of the NO_x Budget Permit. Pursuant to 401 KAR 52:020, Section 3, the source shall operate in compliance with those requirements.

401 KAR 51:210, CAIR NO_x annual trading program, 401 KAR 51:220, CAIR NO_x ozone season trading program, 401 KAR 51:230, CAIR SO₂ trading program and 40 CFR 96, NO_x Budget Trading Program and CAIR NO_x and SO₂ Trading Programs for State Implementation Programs applies to this unit. The CAIR permit application was received on August 30, 2007. Requirements contained in that application were incorporated into and made part of the CAIR permit.

¹ 40 CFR 60 Subpart D, Standards of Performance for Fossil-Fuel-Fired Steam Generators for Which Construction is Commenced After August 17, 1971. 40 CFR Subpart Da, Standards of Performance for Electric Utility Steam Generating Units for Which Construction Commenced After September 18, 1978.

Additional requirements for the source are established in Kentucky's State Implementation Plan at 40 CFR Part 52, Subpart S - Kentucky. Specifically, in 40 CFR 52.939(c):

(49) A revision to the Kentucky SIP for Tennessee Valley Authority Paradise Steam Plant pursuant to the procedures specified in Kentucky regulation 401 KAR 61:015, section 3 was submitted on June 29, 1987, by the Kentucky Natural Resources and Environmental Protection Cabinet. The revised SO₂ limits are contained in Permit Number 0–87–012, issued on June 29, 1987.

(i) *Incorporation by reference.* (A) Permit Number 0–87–012, issued by the Kentucky Natural Resources and Protection Cabinet on June 29, 1987.

(ii) Other material.

(A) Letter of June 27, 1987 from the Kentucky Natural Resources and Environmental Protection Cabinet.

(54) An opacity variance for boiler Units 1 and 2 of Tennessee Valley Authority's (TVA's) Paradise Steam Plant, submitted on August 6, 1986, by the Kentucky Natural Resources and Environmental Protection Cabinet.

(i) *Incorporation by reference.* (A) Permit No. 0–86–75, for the TVA Paradise Steam Plant, issued by the Kentucky Natural Resources and Environmental Protection Cabinet on July 24, 1986.

(B) Letter of August 6, 1986, from the Kentucky Natural Resources and Environmental Protection Cabinet.

As required by the Agreed Order, AO-89-41D, TVA has the following Alternate Opacity Plan for Units 1 and 2.

Operating Condition	Frequency of Method 9 Visible Emission Readings
Both Units Operating	Daily readings for both units
One Unit in Forced Outage	Complete daily readings (for 30 minutes) for three (3) separate days
One Unit in Forced Outage and Three (3) Daily Readings Completed	Complete weekly reading (for 30 minutes) at least once per week until outage concludes.
One Unit in Planned Outage Scheduled for less than 21 days	Complete daily readings (for 30 minutes) for three (3) separate days
One Unit in Planned Outage for less than 21 Days and Three (3) Daily Readings Completed.	Complete weekly reading (for 30 minutes) once per week until outage concludes or two (2) separate weeks

Operating Condition	Frequency of Method 9 Visible Emission Readings
One Unit in Planned Outage Scheduled for more than 21 Days.	Complete weekly readings (for 30 minutes) once per week until outage conclusion

Emission limits are as follows:

Pollutant	Emission Limit	Averaging Period	Regulations
PM	0.11 lbs/MMBtu	3-hour	401 KAR 61:015, Sec. 4(1)
Opacity	Unit 1: 61 % Unit 2: 50 %	6-minute	401 KAR 50:055, Sec 2(6) 40 CFR 52.939(c)(54), Kentucky SIP
SO ₂	1.2 lbs/MMBtu	24-hour	401 KAR 61:015, Sec 5(1) 40 CFR 52.939(c)(49), Kentucky SIP
NO _x	0.86 lbs/MMBtu	annual	401 KAR 52:060 Sec. 2, 40 CFR 76.6(a)(2)

Emission Unit 3 Coal-Fired Boiler, 11,457 MMBtu/hour

Description:	Boiler Unit 3, 11457 MMBtu/hour cyclone-furnace coal fired boilers
Controls:	Overfire air, Selective Catalytic Reduction, Electrostatic Precipitator, Flue Gas Desulfurization
Primary Fuel:	Coal
Alternative Fuels:	No. 2 fuel oil for startup. Coal fines maximum 14% by weight. Wood Waste maximum 5% of the boilers heat input (13% by weight). Other nonhazardous waste materials such as used oil with less than 50 ppm PCB, boiler cleaning chemicals, solvents, oil-contaminated soil, rags, absorbent materials/rags and papers.
Construction Commenced:	1970

Emission Unit 3 is subject to 401 KAR 61:015, Existing indirect heat exchangers applicable to an emissions unit with a capacity of more than 250 MMBtu/hour, which commenced construction before August 17, 1971. 40 CFR 60 Subpart D and Da are not applicable because the unit was constructed prior to the effective date of those regulations.² However, the unit is subject to the federal Acid Rain, NO_x Budget and CAIR Programs.

401 KAR 52:060, Acid rain permits, incorporates by reference 40 CFR Parts 72 to 78. Pursuant to 40 CFR, Part 73.10, Emission Unit 3 has 25,504 SO₂ allowance allocations for the years 2007 to 2009, then 25,558 allowances beginning in the year 2010.

² Ibid.

401 KAR 51:160, NO_x requirements for large utility and industrial boilers, and 40 CFR 96, Subpart C, applies to this unit. The NO_x Budget Permit application was submitted to the Division, and received on November 11, 2004. Requirements contained in that application were incorporated into and made part of the NO_x Budget Permit. Pursuant to 401 KAR 52:020, Section 3, the source shall operate in compliance with those requirements.

401 KAR 51:210, CAIR NO_x annual trading program, 401 KAR 51:220, CAIR NO_x ozone season trading program, 401 KAR 51:230, CAIR SO₂ trading program and 40 CFR 96, NO_x Budget Trading Program and CAIR NO_x and SO₂ Trading Programs for State Implementation Programs applies to this unit. The CAIR permit application was received on August 30, 2007. Requirements contained in that application were incorporated into and made part of the CAIR permit.

Additional requirements for the source are established in Kentucky's State Implementation Plan at 40 CFR Part 52, Subpart S - Kentucky. Specifically, in 40 CFR 52.939(c):

(49) A revision to the Kentucky SIP for Tennessee Valley Authority Paradise Steam Plant pursuant to the procedures specified in Kentucky regulation 401 KAR 61:015, section 3 was submitted on June 29, 1987, by the Kentucky Natural Resources and Environmental Protection Cabinet. The revised SO₂ limits are contained in Permit Number 0–87–012, issued on June 29, 1987.

(i) *Incorporation by reference.* (A) Permit Number 0–87–012, issued by the Kentucky Natural Resources and Protection Cabinet on June 29, 1987.

(ii) Other material.

(A) Letter of June 27, 1987 from the Kentucky Natural Resources and Environmental Protection Cabinet.

A Flue Gas Desulfurization (FGD) scrubber was installed on this unit in 2006. When bypassing the scrubber, the flue gas will be vented to the atmosphere through the existing 800-foot stack. Unit 3 will also vent to atmosphere through the existing 800-foot stack when boiler fire has been extinguished, but the ID fans are still operating to allow the plant to begin maintenance work sooner during an outage. To address EPA objections to the previous draft permit, TVA has agreed to reduce SO₂ emissions to 1.2 lbs/MMBtu when the FGD scrubber is operating and to 3.1 lbs/MMBtu when the scrubber is bypassed. Scrubber bypass shall be limited to 720 hours in any 12-consecutive months.

Emission limits are as follows:

Pollutant	Emission Limit	Averaging Period	Regulations
PM	0.11 lbs/MMBtu	3-hour	401 KAR 61:015, Sec. 4(1)
Opacity	20 %	6-minute	401 KAR 61:015, Sec. 4(2)
SO ₂	1.2 lbs/MMBtu	24-hour	40 CFR 52.939(c)(49), Kentucky SIP
SO ₂ , scrubber	3.1 lbs/MMBtu	24-hour	40 CFR 52.939(c)(49), Kentucky SIP

Pollutant	Emission Limit	Averaging Period	Regulations
bypass			
NO _x	0.86 lbs/MMBtu	annual	401 KAR 52:060 Sec. 2, 40 CFR 76.6(a)(2)

Emission Units 4, 5, and 6 Oil Fired Space Heaters, 25.8 MMBtu/hour

Description:	Three 25.8 MMBtu/hr steam generating boiler for building heat
Controls:	None
Primary Fuel:	No. 2 Fuel Oil
Installed:	Emission Unit 4 and 5: 1963 Emission Unit 6: 1970

These boilers, which are seldom used, provide steam to heat the powerhouse if the associated boiler unit is down during cold weather. There is one at each of the coal-fired boilers. These boilers do not provide steam for startup of the coal-fired boilers. Auxiliary boilers that were formerly used for that purpose in Unit 3 have been removed.

These units were subject to the notification requirements in 40 CFR 63, Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants for Institutional, Commercial, and Industrial Boilers and Process Heaters; applicability date of September 13, 2007. However, 40 CFR Subpart DDDDD has been vacated by the court, and the applicability of CAA Section 112(j) to these units is pending additional determination by U.S. EPA.

Emission limits are as follows:

Pollutant	Emission Limit	Averaging Period	Regulation
PM	0.11 lbs/MMBtu	3-hour	401 KAR 61:015, Sec. 4(1)- Permit O-87-012
Opacity	20 %	6-minute	401 KAR 61:015, Sec. 4(2)- Permit O-87-012
SO ₂	2.1 lbs/MMBtu	24-hour	401 KAR 61:015, sec. 5(1)- Permit O-87-012

Emission Units 7-15 Oil Fired Space Heaters, 2.5 MMBtu/hour

Description:	Eleven 2.5 MMBtu/hour Space Heaters, Dravo/Hastings
Controls:	None
Primary Fuel:	No. 2 Fuel Oil
Installed:	Emission Units 7-12: 1970 Emission Units 13-15: 1981

There are eleven 2.5 MMBtu/hour oil-fired space heaters at PAF. Eight of the space heaters (EU 7A, 7B, 8A, 8B, and 9-12) are located in the Unit 3 powerhouse and three (EU 13-15) are located at the coal wash plant.

Emission limits are as follows:

For EU 7-12

Pollutant	Emission Limit	Averaging Period	Regulation
PM	0.1 lbs/MMBtu	3-hour	401 KAR 61.015, Sec. 4(1), Permit O-87-012
Opacity	20 %	6-minute	401 KAR 61.015, Sec. 4(2), Permit O-87-012
SO ₂	0.8 lbs/MMBtu	24-hour	401 KAR 61.015, Sec. 5(1), Permit O-87-012

For EU 13-15

Pollutant	Emission Limit	Averaging Period	Regulation
PM	0.1 lbs/MMBtu	3-hour	401 KAR 59.015, Permit O-87-012
Opacity	20 %	6-minute	401 KAR 59.015, Permit O-87-012
SO ₂	0.8 lbs/MMBtu	24-hour	401 KAR 59.015, Permit O-87-012

Emission Units 16-18 Natural Draft Cooling Towers

Description:	Three natural draft cooling towers
Maximum Operating Rate:	53,040 gallons/minute
Controls:	Drift Eliminator
Construction Commenced:	Emission Units 16 - 17: 1968 Emission Unit 18: 1969

PAF has three counterblow, natural-draft, hyperbolic cooling towers that release heat to the environment. Dissolved solids found in cooling tower drift can consist of mineral matter, corrosion inhibitors, etc. These units are subject to 401 KAR 63:010, Fugitive emissions.

Emission Units 16-18, 19, 24, 36, 41, 52, 55-58, 71-73, 77, 85 Fugitive Sources

Emission Unit	Description	Maximum Operating Rate	Control Devices	Construction Commenced
19	Receiving and Reclaim Hoppers	3000 tons/hour 17,000,000 tons/year	Wet suppression, enclosure, partial enclosure	1963
24	Coal Open Live Storage Piles #3 and #4	2000 tons/hour 17,000,000 tons/year	Enclosure, partial enclosure	1980

Emission Unit	Description	Maximum Operating Rate	Control Devices	Construction Commenced
36	Coal Live Storage Silos #1 and #2	2000 tons/hour 17,000,000 tons/year	Enclosure	1963
55	Ash/Slag Reclaim from Slag Pond	134 tons/hour	None	1963
56	Ash/Slag Reclaim from Dewatering Area	200 tons/hour	None	1963
57	Ash/Slag Onsite Hauling	200 tons/hour	Wet suppression	1963
71	Transfer to New Conditioner Building Surge Bin and Crushers	2000 tons/hour	Enclosure, foam suppression	1999
72	Crushers (New Conditioner Building) and 3 Conditioners	1320 tons/hour	Enclosure, foam suppression, residual carryover	1999
73	Unit 3 Limestone Rail/Truck Unloading System	900 tons/hour	Wet suppression	2003
77	Unit 3 Contribution to Limestone Bulk Storage Pile	900 tons/hour	Telescoping Chute	2003
85A, B	Unpaved Haul Roads for Hauling Hydrated Lime	14,335 VMT/yr	Wet suppression	Proposed 2010
85C, D, E	Paved Haul Roads for Hauling Hydrated Lime	2,395 VMT/yr	Wet suppression	Proposed 2010
85F, G	Unpaved Haul Roads for Hauling Hydrated Lime	11,468 VMT/yr	Wet suppression	Proposed 2011
85H, I, J	Unpaved Haul Roads for Hauling Hydrated Lime	5,117VMT/yr	Wet suppression	Proposed 2011

401 KAR 63:010 is applicable to these units.³ 40 CFR 60, Subpart Y does not apply to Emission Units 19, 24, 36 and 40 CFR 60, Subpart OOO does not apply to Emission Units 55-57 due to construction commencement dates.⁴ Although Subpart OOO does apply to Emission Units 73 and 77, pursuant to 40 CFR 60.672(d), truck dumping into any screening operation, feed hopper, or crusher is exempt from particulate matter and opacity standards under Subpart OOO. Since no other opacity standard applies, 401 KAR 63:010 applies.

³ 401 KAR 63:010, Fugitive emissions, applies to an apparatus, operation, or road which emits or may emit fugitive emissions provided that the fugitive emissions from such facility are not elsewhere subject to an opacity standard.

⁴ 40 CFR 60, Subpart Y, Standards of Performance for Coal Preparation Plants, commenced after October 24, 1974. 40 CFR 60, Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants, commenced after August 3, 1983.

Emission Units 20, 21, 37, 38 Coal Breakers and Handling

Emission Unit	Description	Maximum Operating Rate	Control Devices	Construction Commenced
20	Breaker Building (Breakers 1-2)	2000 tons/hour 17,000,000 tons/year	Enclosure, Foam Suppression	1963
21	Breaker Building (Breaker 3)	2000 tons/hour 17,000,000 tons/year	Enclosure, Foam Suppression	1970
37	Coal Handling Conditioner Building	2000 tons/hour 17,000,000 tons/year	Enclosure, Foam Suppression	1963
38	Coal Conveying and Bunker Room	2000 tons/hour 17,000,000 tons/year	Enclosure, Residual Carryover	1963

These units pre-date the applicability of 40 CFR 60, Subpart Y (October 24, 1974), emit pollutants from a stack or air pollution control device, were constructed prior to July 2, 1975, and hence are subject to 401 KAR 61:020.⁵

Pursuant to 401 KAR 61:020, Section 3(1), opacity shall not equal or exceed 40%.

PM emission limits (3-hour average) are as follows:

Emission Unit	PM	Regulation
20	92.7 lbs/hour 263 tons/year	401 KAR 61:020, Sec 3(2) Permit O-87-012
21	92.7 lbs/hour 263 tons/year	401 KAR 61:020, Sec 3(2) Permit O-87-012
37	92.7 lbs/hour 263 tons/year	401 KAR 61:020, Sec 3(2) Permit O-87-012
38	86.9 lbs/hour 263 tons/year	401 KAR 61:020, Sec 3(2) Permit O-87-012

Emission Units 22, 23, 25-31, 35, 39, 40 Coal Handling and Washing Plant

Emission Unit	Description	Maximum Operating Rate	Control Devices	Construction Commenced
22	Transfer Station A	2000 tons/hour 13,000,000 tons/year	Enclosure, Residual Carryover of Foam Dust Suppression	1963
23	Transfer Station B	2000 tons/hour 6,500,000 tons/year		1970

⁵ 401 KAR 61:020, Existing process operations, applicable for the control of emissions from existing process operations commenced before July 2, 1975 which are not subject to another particulate emission standard.

Emission Unit	Description	Maximum Operating Rate	Control Devices	Construction Commenced
25	Transfer Station G	2000 tons/hour 13,000,000 tons/year		1981
26	Transfer Station H	2000 tons/hour 13,000,000 tons/year	Enclosure, Foam Suppression	1981
27	Coal Storage Silo 5 & 6	2000 tons/hour, each 6,500,000 tons/year, each	Enclosure, Residual Carryover of Foam Dust Suppression	1981
28	Transfer Station J	2000 tons/hour 13,000,000 tons/year		1981
29	Transfer Station K	2000 tons/hour 13,000,000 tons/year	Enclosure	1981
30	Transfer Station L	1800 tons/hour 13,000,000 tons/year	Enclosure	1981
31	Transfer Station M	1800 tons/hour 13,000,000 tons/year	Enclosure	1981
35	Coal Reclaim Hopper, Long Term Storage Pile	2000 tons/hour 6,500,000 tons/year	Enclosure, Wet and Foam Suppression	1963
39	Receiving and Reclaim Hoppers	3000 tons/hour 17,000,000 tons/year	Enclosure	1981
40	Coal Wash Plant Coarse Refuse Disposal	400 Tons/hour	Wet suppression, partial enclosure	1981

Total emissions of particulate matter from the Coal Washing Plant (Emission Units 22, 23, and 25-31) shall not equal or exceed 100 lb/hour, 1000 lbs/day, and 50 tons/year. [Permit No. O-87-012-40 CFR 52.939(C), Kentucky SIP]

Coal processed through the units described above shall not exceed 13,000,000 tons in any 12-consecutive months [Permit No. O-87-012-40 CFR 52.939(C), Kentucky SIP].

40 CFR 60 Subpart Y is applicable to these units except for Emission Units 22 and 23, which were constructed prior to 1974. However, Subpart Y does not specify a particulate matter standard applicable to these units. Therefore, 401 KAR 61:020 applies to Emission Units 22 & 23, which applies to emission units that emit pollutants from a stack or control device (i.e., non-fugitive) that is not otherwise subject to a particulate emission standard. Emission Units 35, 39 and 40 are sources of fugitive emissions. However, 401 KAR 63:010, Fugitive emissions, does not apply because Subpart Y specifies an opacity standard.

Pursuant to 40 CFR 60.252(c), opacity shall not equal or exceed 20% for any coal processing and conveying equipment, coal storage system, or coal transfer and loading system. Compliance with the opacity limit is demonstrated by weekly opacity observations; if visible emissions are seen then a Method 9 is performed.

PM emission limits are as follows:

Emission Unit	Description	PM Emission Limit	Regulation	Emission Factor including Control Efficiency
22	Transfer Station A	0.45 lbs/hour 1.48 tons/year	40 KAR 61:020	0.30 lb/hr
23	Transfer Station B	7.02 lbs/hour 11.41 tons/year	40 KAR 61:020	0.25 lb/hr
25	Transfer Station G	0.31 lbs/hour 1.02 tons/year	40 KAR 59:010 & 40 CFR 60.252	0.29 lb/hr
26	Transfer Station H	0.31 lbs/hour 1.02 tons/year	40 KAR 59:010 & 40 CFR 60.252	0.02 lb/hr
27	Coal Storage Silo 5	0.45 lbs/hour 0.74 tons/year	40 KAR 59:010 & 40 CFR 60.252	0.10 lb/hr
27	Coal Storage Silo 6	0.22 lbs/hour 0.36 tons/year	40 KAR 59:010 & 40 CFR 60.252	0.10 lb/hr
28	Transfer Station J	0.27 lbs/hour 0.88 tons/year	40 KAR 59:010 & 40 CFR 60.252	0.27 lb/hr
29	Transfer Station K	0.27 lbs/hour 0.88 tons/year	40 KAR 59:010 & 40 CFR 60.252	0.27 lb/hr
30	Transfer Station L	1.58 lbs/hour 5.7 tons/year	40 KAR 59:010 & 40 CFR 60.252	0.31 lb/hr
31	Transfer Station M	0.24 lbs/hour 0.8 tons/year	40 KAR 59:010 & 40 CFR 60.252	0.15 lb/hr

Compliance with the PM limits is demonstrated by proper operation of control equipment and use of emission factors in conjunction with hours of operation. Because the emission factor for each unit is less than or equal to the emission limit, compliance with the hourly emission limit is assumed with proper operation of control equipment. The annual PM emission limit is demonstrated on a monthly basis by using the total hours of operation from the 12-month total and the hourly emission factor. The emission factors are based on AP-42 emission factors from the application.

Emission Units 32 - 34 Coal Conveying and Bunker Room

Emission Unit	Description	Maximum Operating Rate	Control Devices	Construction Commenced
32	Barge Unloader/Surge Hopper	2000 tons/hour 17,000,000 tons/year	Enclosure, water spray	1985
33	Transfer Station	2000 tons/hour	Enclosure, foam	1985

Emission Unit	Description	Maximum Operating Rate	Control Devices	Construction Commenced
	N (Breakers 4-7)	17,000,000 tons/year	suppression, residual carryover, partial enclosure	
34	Transfer Station P and Storage Bypass, Coal Conveyor	2000 tons/hour 17,000,000 tons/year	Enclosure, foam suppression, residual carryover	1985

40 CFR 60 Subpart Y is applicable to these units. However, Subpart Y does not specify a particulate matter standard applicable to these units. Therefore, 401 KAR 59:010 is applicable to these units.⁶

Pursuant to 40 CFR 60.252(c) and 401 KAR 59:010, Section 3(1)(a), opacity shall not equal or exceed 20%.

PM emission limits (3-hour average) are as follows:

Emission Unit	Description	PM Emission Limit	Regulation
32	Barge Unloader/Surge Hopper	58.4 lbs/hour 369 tons/year	401 KAR 59:010, Section 3(2)
33	Transfer Station N (Breakers 4-7)	58.4 lbs/hour 369 tons/year	401 KAR 59:010, Section 3(2)
34	Transfer Station P and Storage Bypass, Coal Conveyor	58.4 lbs/hour 369 tons/year	401 KAR 59:010, Section 3(2)

Emission Units 41- 52 Limestone Handling

Emission Unit	Description	Maximum Operating Rate	Control Devices	Construction Commenced
41	Limestone Receiving	900 tons/hour 919,800 tons/year	Wet Suppression	1982
41A	Alternate Limestone Reclaim	80 tons/hour	None	1996
42	Limestone Reclaim/Receiving Hopper	900 tons/hour 919,800 tons/year	Bagfilter (DC-1)	1982
43-44	Limestone Conveying Transfer Point	900 tons/hour 919,800 tons/year	Bagfilters (DC-2A, 2B)	1982
45	Limestone Silo Loading	900 tons/hour 919,800 tons/year	Bagfilter (DC-3)	1982
46-48	Limestone Silo Unloading	240 tons/hour 919,800 tons/year	Bagfilters (DC-4A, 4B, 4C)	1982

⁶ 401 KAR 59:010, New process operations, applicable for the control of emissions from existing process operations commenced after July 2, 1975 which are not subject to another particulate emission standard.

Emission Unit	Description	Maximum Operating Rate	Control Devices	Construction Commenced
49-51	Limestone Prep Building Surge and Weigh Hopper	300 tons/hour 919,800 tons/year	Bagfilters (DC-5A, 5B, 5C)	1982
52	Limestone Stock-out and Storage	900 tons/hour 919,800 tons/year	Partial Enclosure	1982

Particulate matter emissions shall not exceed 25 tons in any 12-consecutive months. [Permit No. O-87-012-40 CFR 52.939(C), Kentucky SIP]

Emission Units 42-51 are subject to 401 KAR 59:010, and Emission Units 41, 41A, and 52 are subject to 401 KAR 63:010. These units either pre-date 40 CFR 60, Subpart OOO or are exempted from Subpart OOO particulate matter and opacity standards pursuant to 40 CFR 60.672(d).

PM emission limits (3-hour average) are as follows:

Emission Unit	Description	PM Emission Limit	Regulation
42	Limestone Reclaim/Receiving Hopper	51.4 lbs/hour	401 KAR 59:010, Section 3(2)
43-44	Limestone Conveying Transfer Point	51.4 lbs/hour	401 KAR 59:010, Section 3(2)
45	Limestone Storage Silo Bin	51.4 lbs/hour	401 KAR 59:010, Section 3(2)
46-48	Limestone Storage Silo Vibrating Feeder	41.6 lbs/hour	401 KAR 59:010, Section 3(2)
49-51	Limestone Prep Building Surge Hopper	43.1 lbs/hour	401 KAR 59:010, Section 3(2)

Emission Units 53-54 Two Lime Storage Silos

These units have been decommissioned and shall not be operated.

Emission Unit 58 Gypsum Handling

Emission Unit	Description	Maximum Operating Rate	Control Devices	Construction Commenced
58	Rim ditch formation	108 tons/hour	Wet suppression	1994
	Open drying of gypsum	167 tons/hour	Wet suppression	1994
	Excavation and transport of gypsum	167 tons/hour	Wet suppression	1983
	Soil cover transport	358 tons/hour	Wet suppression	1983

This unit is subject to 40 CFR 60, Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants commenced after August 3, 1983. However, pursuant to 40 CFR 60.672(d), truck dumping into any screening operation, feed hopper, or crusher is exempt from particulate matter and opacity standards under Subpart OOO. As another opacity standard is not applicable, this unit is subject to 401 KAR 63:010.

Emission Units 59-70 Reserved

Although previously permitted, these units were never constructed.⁷

Emission Units 74-76 Limestone Handling

Emission Unit	Description	Maximum Operating Rate	Control Devices	Construction Commenced
74	Unit 3 Reclaim/Receiving Hopper (limestone)	900 tons/hour	Wet suppression	2003-S-99-064
75	Unit 3 Limestone Storage Silo	900 tons/hour	Enclosure	2003 -S-99-064
76	Unit 3 Limestone Prep Building	600 tons/hour	Enclosure	2003- S-99-064

These units are subject 40 CFR 60 Subpart OOO. Emission Unit 75 is limited to 900 tons/hour and Emission Unit 76 is limited to 600 tons/hour.

Pursuant to CFR 672(a)(1), particulate matter stack emissions shall not exceed 0.05 g/dscm (0.022 gr/dscf).

Pursuant to 40 CFR 672(a)(2), visible stack emissions shall not equal or exceed 7% opacity.

Pursuant to 40 CFR 672(b), visible fugitive emissions shall not equal or exceed 10% opacity.

Emission Unit 79-84 Coal Fines Handling

Emission Unit	Description	Maximum Operating Rate	Control Devices	Construction Commenced
79	Pan scraper Load out from Coal Fines Pond to Stockpile	400 tons/hour	Wet suppression	2006
80	Coal Fines Stockpile	4.2 acres/day	Wet suppression	2006
81	Front-end Loader from Stockpile to Reclaim Hopper	200 tons/hour	Wet suppression	2006

⁷ Permit No. S-99-064

Emission Unit	Description	Maximum Operating Rate	Control Devices	Construction Commenced
82	Reclaim Hopper and Transfer Point (to Conveyor 63)	200 tons/hour	Enclosure	2006
83	Screw Conveyor and Transfer Point (to Conveyor 64)	200 tons/hour	Enclosure	2006
84	Belt Conveyor and Transfer Point (to BC-45 at Station A)	200 tons/hour	Enclosure	2006

These units are subject to 40 CFR 60, Subpart Y and to preclude applicability of 401 KAR 51:017, coal fines processed through Emission Units 79-84 shall not exceed 750,000 tons per any 12-consecutive months. Permit #VS-006-003 applied 401 KAR 63:010, Fugitive emissions to Emission Units 79-81. However, 401 KAR 63:010 is only applicable if fugitive emissions are not elsewhere subject to an opacity standard [401 KAR 63:010, Section 2(1)]. Since Subpart Y imposes an opacity standard, 401 KAR 63:010 does not apply.

Pursuant to 60.252(c), the owner or operator shall not cause to be discharged into the atmosphere from any coal processing and conveying equipment, coal storage system, or coal transfer and loading system, gases which exhibit 20 percent opacity or greater.

Emission Unit 85 Limestone Handling and Storage

Emission Unit	Description	Maximum Operating Rate	Control Devices	Construction Commenced
86-89	Transfer from truck to four silos for Unit 3 HLI system	22 tons/hr	Bagfilter	Proposed 2010 (V-07-018)
90-93	Four Feed Hopper Loading Silos for Unit 3 HLI system	1.5 ton/hr	Bagfilter	Proposed 2010 (V-07-018)
94-95	Transfer from truck to two silos for Units 1 and 2 HLI system	900 tons/hour 919,800 tons/year	Bagfilter	Proposed 2011 (V-07-018)
96-97	Two Feed Hopper Loading Silos for Units 1 and 2 HLI system	900 tons/hour 919,800 tons/year	Bagfilters	Proposed 2011 (V-07-018)

These units are associated with the hydrated lime injection (HLI) systems that are being added to Emission Units 1 and 2. These units are subject to 401 KAR 59:010 for opacity and PM. The equipment is not subject to 40 CFR 60 Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants, because the affected facility does not meet the definition of a non-metallic minerals processing plant for lime. Compliance with the opacity standard is demonstrated by weekly visible observations and if any visible emissions are seen a Method 9 is conducted. Based on the maximum PM emission rate for each unit, these units emit less than the

lowest allowable limit (2.54 lb/hr) under 401 KAR 59:010. Therefore, compliance with the PM standard is demonstrated by proper operation of the control equipment.

Emission Unit	Maximum PM Emission Rate	PM Emission Limit in lb/hr on 3-hr average	Regulation
86-89	0.064 lb/hr	<i>Note:</i> Pursuant to 401 KAR 59:010, Section 3(2), particulate emissions from the stack shall not exceed $[3.59(P)^{0.62}]$ pound per hour, where P is the monthly average processing rate in tons per hour. <i>If the process rate weight is 1,000 lbs/hr or less than the limit on particulate matter emissions is 2.34 lbs/hr.</i>	401 KAR 59:010, Section 3(2)
90-93	0.003 lb/hr	Same	401 KAR 59:010, Section 3(2)
94-95	0.064 lb/hr	Same	401 KAR 59:010, Section 3(2)
96-97	0.011 lb/hr	Same	401 KAR 59:010, Section 3(2)

EMISSIONS AND OPERATING CAPS DESCRIPTIONS:

- Coal processed through Emission Units 22, 23, 25-31, 35, 39, and 40 shall not exceed 13,000,000 tons per any 12 consecutive months [Permit No. O-87-012-40 CFR 52.939(C), Kentucky SIP].
- Total emissions of particulate matter from the Coal Washing Plant (Emission Units 22, 23, 25-31, and 35) shall not equal or exceed 100 lb/hour, 1000 lbs/day, and 50 tons/year [Permit No. O-87-012-40 CFR 52.939(C), Kentucky SIP].
- To preclude applicability of 401 KAR 51:017, particulate matter emissions from limestone handling, Emission Units 41-52, shall not exceed 25 tons in any 12 consecutive months [Permit No. O-87-012-40 CFR 52.939(C), Kentucky SIP].
- Emission Units 53 and 54 are decommissioned and shall not be operated.
- Emission Units 75 and 76 are limited to 900 tons/hour and 600 tons/hour respectively [Permit No. O-87-012-40 CFR 52.939(C), Kentucky SIP].
- To preclude the applicability of 401 KAR 51:017, coal fines processed through Emission Units 79-84 shall not exceed 750,000 tons per any 12 consecutive months.
- To preclude the applicability of 401 KAR 63:020, for arsenic or other metal preservative emissions, the source shall not combust wood treated with arsenic (CCA) or other metals as preservatives.
- Bypass of the Emission Unit 3 scrubber shall be limited to 30 days in any 12-consecutive months [V-07-018].

Appendix A

TVA Paradise Emission Unit Number Listing

Emission Unit Numbers			Unit Description
New ID	Previous Permit	DAQ Administrative	
1	1	COMB01	Unit 1, 6959 MMBtu/hour
2	2	COMB02	Unit 2, 6959 MMBtu/hour
3	3	COMB03	Unit 3, 11457 MMBtu/hour
4	26	COMB04	Unit 1 Building Heat Boiler, 25.8 MMBtu/hour
5	26	COMB04	Unit 2 Building Heat Boiler, 25.8 MMBtu/hour
6	28	COMB05	Unit 3 Building Heat Boiler, 25.8 MMBtu/hour
7	29	EQPT22	2 Dravo Heaters (Unit 3 Powerhouse)
8	29	EQPT22	2 Dravo Heaters (Unit 3 Powerhouse)
9	29	EQPT22	Dravo Heater (Unit 3 Powerhouse)
10	29	EQPT22	Dravo Heater (Unit 3 Powerhouse)
11	29	EQPT22	Dravo Heater (Unit 3 Powerhouse)
12	29	EQPT22	Dravo Heater (Unit 3 Powerhouse)
13	29	EQPT36	Dravo/Hastings Heater (Coal Wash Plant)
14	29	EQPT36	Dravo/Hastings Heater (Coal Wash Plant)
15	29	EQPT36	Dravo/Hastings Heater (Coal Wash Plant)
16-18	NA		Cooling Towers, 16 & 17
19	15	EQPT12	Receiving and Reclaim Hoppers
20	16	EQPT13	Breaker Building (Breakers 1 and 2)
21	16	EQPT13	Breaker Building (Breaker 3)
22	4	EQPT01	Coal Handling Transfer Station A
23	5	EQPT02	Coal Handling Transfer Station B
24	18	STOR01	Coal Open Live Storage Piles #3 and #4
25	6	EQPT03	Coal Handling Transfer Station G
26	7	EQPT04	Coal Handling Transfer Station H
27	8,9	EQPT05 & 06	Coal Live Storage Silos #5 and #6
28	10	EQPT07	Coal Handling Transfer Station J
29	12	EQPT09	Coal Handling Transfer Station K
30	14	EQPT11	Coal Handling Transfer Station L
31	13	EQPT10	Coal Handling Transfer Station M
32	17	EQPT14	Barge Unloader/Surge Hopper
33	17	EQPT14	Transfer Station N (Breakers 4, 5, 6, and 7)
34	17,35	EQPT14, 27	Transfer Station P and Storage Bypass, Coal Conveyor
35	11,15,17,18,33	EQPT08, 12, 14, 25	Coal Reclaim Hopper, Long-term Open Storage Pile
36	18	STOR01	Coal Live Storage Silos #1 and #2
37	16	EQPT13	Coal Handling Conditioner Building
38	17	EQPT14	Coal Conveying and Bunker Room
39	15	EQPT12	Receiving and Reclaim Hoppers
40	NA		Coal Wash Plant Coarse Refuse Disposal
41	20	EQPT16	Limestone Receiving
41A	NA		Alternate Limestone Reclaim System

Statement of Basis

Emission Unit Numbers			Unit Description
New ID	Previous Permit	DAQ Administrative	
42	20	EQPT16	Limestone Reclaim/Receiving Hopper
43-44	21	EQPT17	Limestone Conveying Transfer Point
45	23	EQPT19	Limestone Silo Loading
46-48	24	EQPT20	Limestone Silo Unloading
49-51	25	EQPT21	Limestone Prep Building Surge Hopper and Weigh Hopper
52	22	EQPT18	Limestone Stock-out and Storage
53-54	19	EQPT15	Two Limestone Silos (decommissioned)
55	30	EQPT23	Ash/Slag Reclaim from Slag Pond
56	30	EQPT23	Ash/Slag Reclaim from Dewatering Area
57	30	EQPT23	Ash/Slag Onsite Hauling
58	NA	EQPT30	Gypsum Handling (Rim ditch disposal began 1994)
			Rim Ditch Formation
			Open Drying of Gypsum
			Excavation and Transport of gypsum
			Soil Cover Transport
59-70			Reserved (never constructed)
		EQPT25	Coal Stock out Conveyor (never constructed)
		EQPT27	Coal Conveyor (never constructed)
		EQPT29	Transfer Station Q (never constructed)
			BC9 to Conditioner Surge Bin (never constructed)
			Transfer to Crushers (never constructed)
			Conditioners #5 and 6 (never constructed)
71	71		Transfer to New Conditioner Building Surge Bin and Crushers
72	72		Crushers (New Conditioner Building) and 3 Conditioners
73	NA	EQPT31	Unit 3 Limestone Rail/Truck Unloading System
74	NA	EQPT32	Unit 3 Reclaim/Receiving Hopper
75	NA	EQPT33	Unit 3 Limestone Storage Silo
76	NA	EQPT34	Unit 3 Limestone Prep Building
77	NA	EQPT35	Unit 3 Contribution to Limestone Bulk Storage Pile
78	NA		Unit 3 Stack (Scrubber)
79	59	EQPT40	Pan scraper Load out from Coal Fines to Stockpile
80	60	STOR07	Coal Fines Stockpile
81	61	EQPT41	Front-end Loader from Stockpile to Reclaim Hopper (62)
82	62	EQPT37	Reclaim Hopper and Transfer Point to Conveyor 63
83	63	EQPT38	Screw Conveyor and Transfer Point to Conveyor 64
84	64	EQPT39	Belt Conveyor and Transfer Point to BC-45 at Station A
85	NA	AREA06	Paved and Unpaved Truck Hauling for HLI System
86	NA	EQPT73	Lime Transfer from Truck to Silo #1 for Unit #3
87	NA	EQPT73	Lime Transfer from Truck to Silo #2 for Unit #3
88	NA	EQPT73	Lime Transfer from Tuck to Silo #3 for Unit #3
89	NA	EQPT73	Lime Transfer form Truck to Silo #4 for Unit #3
90	NA	EQPT74	Lime Feed Hopper Loading Silo #1 for Unit #3

Emission Unit Numbers			Unit Description
New ID	Previous Permit	DAQ Administrative	
91	NA	EQPT74	Lime Feed Hopper Loading Silo #2 for Unit #3
92	NA	EQPT74	Lime Feed Hopper Loading Silo #3 for Unit #3
93	NA	EQPT74	Lime Feed Hopper Loading Silo #4 for Unit #3
94	NA	EQPT75	Lime Transfer from Truck to Silo #1 for Unit #1
95	NA	EQPT75	Lime Transfer from Truck to Silo #2 for Unit #2
96	NA	EQPT76	Lime Feed Hopper Loading Silo #1 for Unit #1
97	NA	EQPT76	Lime Feed Hopper Loading Silo #2 for Unit #2